TM 11-212-20

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

Posted Ch #2
6 Nov 66

RADIO SET AN/TRC-47

ORGANIZATIONAL MAINTENANCE

B-11

HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1958

TM 11–212–20
*C 2

TECHNICAL MANUAL

RADIO SET AN/TRC–47

Organizational Maintenance

TM 11–212–20
CHANGE No. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *16 September 1963*

TM 11–212–20, 21 May 1958, is changed as follows:

Page 2, paragraph 1 (as changed by C 1, 28 Aug 61). Delete subparagraph *g.*

Add paragraph 1.1 after paragraph 1.

1.1.1 Index of Publications

Refer to the latest issue of DA Pam 310–4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment. DA Pamp 310–4 is an index of current technical manuals, technical bulletins, supply bulletins, lubrication orders, and modification work orders available through publications supply channels. The index lists the individual parts (–10, –20, –35P, etc) and the latest changes to and revisions of each equipment publication.

Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38–750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71–4 (Air Force).

c. Reporting of Equipment Manual Improvements. The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9) will be used for reporting these improvements. This form will be completed in triplicate using pencil, pen or typewriter. The original and one copy will be forwarded direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N.J. 07703. One information copy will be furnished to the individual's immediate supervisor (e.g., officer, noncommissioned officer, supervisor, etc).

Page 3, paragraph 3, line 1. Change "appendix" to: Appendix II.

Paragraph 4 (as changed by C 1, 28 Aug 61). Change "TM 11–212–20P" to: TM 11–5820–361–20P.

Delete paragraph 5 and substitute:

5. Preventive Maintenance

a. Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition, prevent breakdowns, and assure maximum operational capability. Preventive maintenance is the responsibility of all echelons concerned with the equipment and includes the inspection, testing, and repair or replacement of parts, subassemblies, or units that inspection and tests indicate probably would fail before the next scheduled periodic service. Preventive maintenance service and inspections of Radio Set AN/TRC–47 at the second echelon level are made at quarterly intervals unless otherwise directed by the commanding officer.

b. Maintenance forms and records to be used and maintained on this equipment are specified in TM 38–750.

Add paragraphs 5.1 and 5.2 after paragraph 5.

5.1.1 Quarterly Maintenance

Quarterly preventive maintenance checks and services on Radio Set AN/TRC–47 are required.

* This change supersedes C 1, 28 August 1961.

TECHNICAL MANUAL
No. 11-212-20

HEADQUARTERS,
DEPARTMENT OF THE ARMY,
WASHINGTON 25, D. C., *21 May 1958*

RADIO SET AN/TRC-47
ORGANIZATIONAL MAINTENANCE

		Paragraph	Page
CHAPTER 1.	INTRODUCTION		
	Scope	1	2
	Forms and records	2	2
2.	MAINTENANCE INSTRUCTIONS		
Section I.	Maintenance		
	Scope of second echelon maintenance	3	3
	Tools, materials, and test equipment required	4	3
	Second echelon preventive maintenance	5	3
	Lubrication	6	6
II.	Troubleshooting		
	Visual inspection	7	6
	Equipment performance check list	8	6
	Tube testing techniques	9	9
	Repair of defective cords and cables	10	12
	Repairing shielded cables	11	13
CHAPTER 3.	SHIPMENT AND LIMITED STORAGE		
	Disassembly of equipment	12	15
	Repackaging for shipment or limited storage	13	15
APPENDIX	MAINTENANCE ALLOCATION CHART		17

Periodic daily services (TM 11–212–10) constitute a part of the quarterly maintenance checks and services and must be performed concurrently. All deficiencies and shortcomings will be recorded in accordance with the requirements of TM 38–750. Perform all checks and services listed in the quarterly maintenance checks and services chart (par. 5.2) in the sequence listed.

5.2 Quarterly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Completeness	See that the equipment is complete.	Appx. II, TM 11–212–10.
2	Publications	See that all publications are complete, serviceable and current.	DA PAM 310–4.
3	Modifications	Determine whether new applicable MWO's have been published. All URGENT MWO's must be applied immediately; all NORMAL MWO's must be scheduled.	DA PAM 310–4 and TM 38–750.
4	Preservation	Check all surfaces for evidence of fungus. Remove rust with fine sandpaper. Brush two thin coats of paint on the bare metal.	TM 9–213.
5	Loose components	Inspect knobs, switches, receptacles, transformers, pilot lamps, and connectors for looseness.	
6	Pluckout items	Inspect seating of tubes, pilot lamps, fuses, and crystals for proper seating.	
7	Relay	Inspect the relay for loose mountings, bad contacts, and misalignment of springs.	
8	Resistors	Inspect resistors for cracks, chipping, discoloration, and blistering.	
9	Terminal blocks	Inspect terminal blocks for cracks, loose connections, and breaks.	
10	Capacitors	Inspect capacitors for dirt and corrosion.	
11	Transformers	Inspect transformers for overheating.	

Page 4 and 5 (as changed by C 1, 28 Aug 61). Delete figure 1.

Page 6, paragraph 8*c,* step 1, action column (as changed by C 1, 28 Aug 61). After the last sentence, add: Check the cable connections between connector J6, on the converter, and the ventilating fan.)

Page 7, step 5, normal indication column (as changed by C 1, 28 Aug 61).

Add: The ventilating fan starts.

Corrective measures column (as changed by C 1, 28 Aug 61). After "power cable" add: and the ventilating fan cable.

Page 8, step 8 (as changed by C 1, 28 Aug 61). Delete the information in the action and normal indication columns and substitute:

Action	Normal indication
Place the METER SWITCH in the following positions:	Normal readings for 1-watt output:
OSC IG	Between .35 and .5 ma.
OSC IK	Between .45 and .6 ma.
1 TRIP IG	Between .35 and .6 ma.
1 TRIP IK	Between .3 and .6 ma.
2 TRIP IG	Between .4 and .6 ma.
2 TRIP IK	Between .35 and .6 ma.
DRIVER IG	Between .3 and .6 ma.
DRIVER IK	Between .35 and .65 ma.
PA IG	Between .3 and .6 ma.
PA IP	Between .3 and .85 ma.
MOD IK	Between .5 and .8 ma.

Step 9, normal indication column, line 6. Delete: and 20 cps ringing current is fed out of converter and activates line signal on panel of local switchboard.

Page 17. Designate the existing appendix: APPENDIX II. Insert APPENDIX I before APPENDIX II.

APPENDIX I

REFERENCES

Following is a list of references available to the organizational repairman of the AN/TRC–47:

DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
TM 9–213	Painting Instructions for Field Use.
TM 11–212–10	Radio Set AN/TRC–47, Operator's Manual.
TM 11–5820–361–20P	Organizational Maintenance Repair Parts and Special Tools List, Radio Set AN/TRC–47.
TM 11–6625–203–12	Operation and Organizational Maintenance, Multimeter AN/URM–105, Including Multimeter ME–77/U.
TM 11–6625–274–12	Operator's and Organizational Maintenance Manual, Test Sets, Electron Tube TV–7/U, TV–7A/U, TV–7B/U, and TV–7D/U.
TM 38–750	The Army Equipment Records System and Procedures.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12–32, section II (unclas) requirements for Nike-Hercules, Pershing and Nike-Ajax—TM—Radio.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1963—707303

TECHNICAL MANUAL
No. 11-212-20

HEADQUARTERS,
DEPARTMENT OF THE ARMY,
WASHINGTON 25, D. C., *21 May 1958*

RADIO SET AN/TRC-47
ORGANIZATIONAL MAINTENANCE

		Paragraph	Page
CHAPTER 1.	INTRODUCTION		
	Scope	1	2
	Forms and records	2	2
2.	MAINTENANCE INSTRUCTIONS		
Section I.	Maintenance		
	Scope of second echelon maintenance	3	3
	Tools, materials, and test equipment required	4	3
	Second echelon preventive maintenance	5	3
	Lubrication	6	6
II.	Troubleshooting		
	Visual inspection	7	6
	Equipment performance check list	8	6
	Tube testing techniques	9	9
	Repair of defective cords and cables	10	12
	Repairing shielded cables	11	13
CHAPTER 3.	SHIPMENT AND LIMITED STORAGE		
	Disassembly of equipment	12	15
	Repackaging for shipment or limited storage	13	15
APPENDIX	MAINTENANCE ALLOCATION CHART		17

CHAPTER 1
INTRODUCTION

1. Scope

a. This manual covers organizational (second echelon) maintenance of Radio Set AN/TRC–47.

b. The complete instructions for organizational maintenance includes the operator's maintenance manual, TM 11–212–10.

c. TM 11–5083 is applicable to this equipment and is available to the second echelon repairman.

d. The appendix contains the maintenance allocation chart.

e. The repair parts and special tools list will be published separately.

f. Official nomenclature followed by (*) is used to indicate all models of the equipment item covered by this manual. Thus, Electron Tube Test Set TV–7(*)/U represents Electron Tube Test Sets TV–7A/U, TV–7B/U, and TV–7C/U.

g. Forward comments ~~on this manual directly to Commanding Officer, United States Army Signal~~ Publications Agency, Fort Monmouth, N. J.

ADDED Par. 1.1 See Ch #2

2. Forms and Records

Refer to TM 11–212–10, Radio Set AN/TRC–47, Operator's Manual, paragraph 2.

Par. 2 Deleted
Substitute C #2

CHAPTER 2

MAINTENANCE INSTRUCTIONS

Section I. MAINTENANCE

3. Scope of Second Echelon Maintenance

Refer to the appendix for the scope of second echelon maintenance.

4. Tools, Materials, and Test Equipment Required

Refer to ~~TM 11-212-20P~~ TM 11-5820-341-20P for parts normally stocked for second echelon maintenance. Refer to the appendix of this manual for tools, materials, and test equipment required for second echelon maintenance.

5. Second Echelon Preventive Maintenance

a. DA Form 11-238. DA Form 11-238 (fig. 1) is a preventive maintenance check list to be used by the second echelon repairman. Items not applicable to the equipment are lined out in the figure. References in the ITEM block in the figure are to paragraphs that contain additional maintenance information pertinent to the particular item. Instructions for the use of the form appear on the form.

b. Items. The information shown in this subparagraph is supplementary to DA Form 11-238 for Radio Set AN/TRC-47. The item numbers correspond to the ITEM numbers on the form.

Warning: Disconnect all power when it is necessary to perform preventive maintenance operations. When power to the equipment is disconnected, some capacitors still may retain voltage of dangerous potential. Before touching exposed electrical parts, short circuit the part to ground. When maintenance is completed, replace the equipment in its case, reconnect the power, and check for satisfactory operation.

Item	Maintenance procedures
17	Do not align the capacitor plates on the receiver. Perform visual inspection only and if misalinement is apparent, send receiver to a higher echelon for repair.
18	Do not replace parts on the receiver. Send the receiver to higher echelon for repair. Perform visual inspection only.

Para. Delet. See C#2

Add Para. 5.1 & 5.2 C#2

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
26. INSPECT ANTENNA FOR ECCENTRICITIES, CORROSION, LOOSE FIT, DAMAGED INSULATORS AND REFLECTORS.	✓
27. CHECK FOR NORMAL OPERATION.	✓
28. ~~BEFORE SHIPPING OR STORING, REMOVE CALIBRATION~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
SOUND EQUIPMENT, RADIO, DIRECTION FINDING
RADAR, CARRIER, RADIOSONDE AND TELEVISION
(AR 750-625)

EQUIPMENT NOMENCLATURE: RADIO SET AN/TRC-47*

EQUIPMENT SERIAL NUMBER: 00000-00

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon:
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

TYPE OF INSPECTION

OPERATOR	2/3 ECHELON	DATE	SIGNATURE
	✓	7 OCT 1967	John Doe

FOLD

DA FORM 1 MAY 67 11-238

REPLACES DA FORMS 11-238, 1 NOV 55; 11-238, 11-244, 11-245, 11-248, 11-249, 11-250, AND 11-251; WHICH ARE OBSOLETE.

Figure 1. DA Form 11-238 (pages 1 and 4).

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF OCTOBER

NO.	DAILY ITEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2D 3D ECHELON
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1.	COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT. *(Transmitter, receiver, carrying cases, wire, cables, microphones, tubes, spare parts, technical manuals).*	✓	✓	✓	✓	✓	✓	✓										
2.	CLEAN DIRT AND MOISTURE FROM ANTENNA, MICRO-PHONES, HEADSETS, KEYS, JACKS, PLUGS, COMPONENT PANELS.	✓	✓	✓	✓	✓	✓	✓										
3.	INSPECT CONTROLS FOR NORMAL OPERATION. TAP CONTROLS LIGHTLY FOR EVIDENCE OF CUT-OUT FROM LOOSE CONTACTS.	✓	✓	✓	✓	✓	✓	✓										
4.	CHECK FOR NORMAL OPERATION OF EQUIPMENT. BE ALERT FOR UNUSUAL OPERATION OR CONDITION.	✓	✓	✓	✓	✓	✓	✓										

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. CLEAN AND TIGHTEN EXTERIORS OF CASES, RACKS, MOUNTS, TRANSMISSION LINES.	✓					
6. INSPECT CASES, MOUNTS, ANTENNA POSTS AND EXPOSED METAL SURFACES FOR RUST, CORROSION.	✓					
7. INSPECT CORDS, CABLE, WIRE, SHOCK MOUNTS FOR CUTS, KINKS, BREAKS, FRAYING, UNDUE STRAIN.	✓					
8. CHECK ANTENNA GUY WIRES FOR PROPER TENSION OR DAMAGE.	⊗					
9. INSPECT CANVAS AND LEATHER ITEMS FOR MILDEW, TEARS, FRAYING.						
10. INSPECT ACCESSIBLE ITEMS FOR LOOSENESS: SWITCHES, KNOBS, JACKS, CONNECTORS, RELAYS, TRANSFORMERS, MOTORS, PILOT LIGHTS, BLOWERS, ETC.	✓					
11. CLEAN AND/OR INSPECT AIR FILTERS, BRASS NAME PLATES, DIAL AND METER WINDOWS.	✓					
12. INSPECT STORAGE BATTERIES FOR DIRT, LOOSE TERMINALS, CORRECT GRAVITY, DAMAGED CASES. INSPECT DRY BATTERIES FOR TERMINALS.						

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
13. INSPECT SHELTERS AND COVERS FOR ADEQUACY OF WEATHER PROOFING, TEARS, PAINTING.	
14. CHECK TERMINAL BOX COVERS FOR GROUNDS, DIRT, TEARS, DAMAGED GASKETS, BREAKS.	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. INSPECT SEATING OF READILY ACCESSIBLE PLUG-OUT ITEMS: TUBES, LAMPS, FUSES, CRYSTALS, CONNECTORS, VIBRATORS, PLUG-IN COILS.	✓
16. INSPECT RELAYS AND CIRCUIT BREAKERS FOR LOOSE MOUNTINGS, BAD CONTACTS, MIS-ALINEMENT OF CONTACTS AND SPRINGS, PROPER SPRING TENSION.	✓
17. INSPECT VARIABLE CAPACITORS FOR DIRT, MIS-ALINEMENT OF PLATES, LOOSE MOUNTINGS, MOISTURE. PAR. 5b	✓
18. INSPECT RESISTORS, BUSHINGS AND INSULATORS FOR CRACKS, CHIPPING, BLISTERING, MOISTURE, DISCOLORATION. PAR. 5b	✓
19. CLEAN AND TIGHTEN SWITCHES, TERMINAL BLOCKS, BLOWERS, RELAY CASES AND INTERIORS OF CHASSIS AND CABINETS NOT READILY ACCESSIBLE.	✓
20. INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.	✓
21. INSPECT TERMINALS OF LARGE FIXED CAPACITORS AND RESISTORS FOR DIRT, CORROSION, LOOSE CONTACTS.	
22. INSPECT TRANSFORMERS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR OVERHEATING AND OIL LEAKAGE.	✓
23. INSPECT GENERATORS, AMPLIFIERS, DRIVE MOTORS FOR BRUSH WEAR, SPARKS, TENSION, ARCING AND PITTING OF COMMUTATOR.	
24. INSPECT CHARGED FUSES FOR BURNS, CORROSION, CRACKS.	
25. INSPECT WATERPROOF GASKETS FOR TEARS, WORN OR LOOSE PARTS.	

CONTINUED ON PAGE 4

2 3

GPO: 1957 O—427034

TM212-20(2)

Figure 1. DA Form 11-238 (pages 2 and 3)—Continued.

6. Lubrication

In Radio Set AN/TRC–47, there are no parts that require lubrication.

Section II. TROUBLESHOOTING

7. Visual Inspection

a. When failure is encountered and the cause is not immediately apparent, check as many of the items listed in *b* below as is practicable before starting the operational check of the equipment. If possible, obtain information from the operator of the equipment regarding its performance at the time the trouble occurred.

b. Partial or complete failure of the radio set or indications of improper operation may be caused by one or more of the following faults:

(1) Improperly connected cords or cables.
(2) Worn, broken, or disconnected cords or cables.
(3) Defective fuses.
(4) Defective indicator lamps.
(5) Defective, or improper seated tubes.
(6) Defective, binding, or dirty switches and controls.
(7) Defective crystals.
(8) Burned insulation and resistors.

8. Equipment Performance Checklist

a. General. The equipment performance checklist is a procedure used to systematically check equipment performance. All corrective measures which the second echelon repairman can perform are given in the *corrective measures* column. When using the check list, start at the beginning and follow each step in order. If the corrective measures indicated do not fix the equipment, troubleshooting by higher echelon is required. Multimeter ME–77/U will be used to make all voltage and continuity checks. The voltage and continuity checks are included as an aid to isolate the trouble to a particular stage. If voltage and continuity checks isolate the trouble to a particular part where a running spare (TM 11–212–10) is available, the second echelon repairman can replace the defective part; otherwise, the equipment must be forwarded to higher echelon for repair. Note on the repair tag how the equipment performed and what corrective measures were taken. Refer to TM 11–212–10 for the cabling diagram, location of controls, and adjustment of the transmitter for 1 watt output.

b. Procedure. Place the set in operation. Allow the equipment to warm up for approximately 5 minutes. Operate the equipment as shown in the checklist below.

c. Equipment Performance Checklist.

	Step	Unit	Action	Normal indication	Corrective measures
PREPARATORY	1	Converter.....	Place the POWER switch in the OFF position. Check the power cable connection between connector J5 on the converter and an ac source.		
	2	Receiver.....	Place the POWER switch in the OFF position. Check the power cable connection between connectors J8 on the converter and J2 on the receiver. Set the squelch switch to SQUELCH position. Turn SENSITIVITY control fully clockwise.		

	Step	Unit	Action	Normal indication	Corrective measures
PREPARATORY	3	Transmitter.....	Set the VOLUME control to midposition. Place FIL and PLATE switches in their OFF position. Check the power cable connection between connectors J7 on the converter and J2 on the transmitter. Place the METER SWITCH in the PA Ip position.		
EQUIPMENT PERFORMANCE	4	Transmitter.....	Set the FIL switch to ON.	FIL indicator lamp lights.	Make continuity tests of the following items: Transmitter fuse. Indicator lamp. Power cable (par. 10). Use ac voltmeter to check transmitter power input source at J7 on converter (TM 11-212-10).
	5	Converter.....	Set the power ON-OFF switch to ON.	POWER indicator lamp lights, the ventilating fan starts.	Make continuity tests of the following items: Converter fuse. Indicator lamp. Power cable (par. 10). fan cable Use ac voltmeter to check converter power input source at J5 on the converter (TM 11-212-10).
	6	Receiver.....	Set the power ON-OFF switch to ON (remote transmitter off).	POWER indicator lamp lights.	Make continuity test on the following items: Receiver fuse. POWER indicator lamp. Power cable (par. 10).
				STDBY lamp is off, REC lamp is on, a rushing noise is heard in the loudspeaker.	Make continuity test on REC lamp filament.
			Rotate SENSITIVITY control knob counter clockwise until squelch operates (remote transmitter off).	STDBY lamp is on. REC lamp is off. Rushing noise in speaker is silenced.	Use Electron Tube Test Set TV-7/U and check tubes V9 and V10.
			Same as above (remote transmitter on).	STDBY lamp is off. REC lamp is on.	Use Electron Tube Test Set TV-7/U and check tube V8.
	7	Transmitter.....	Set the PLATE switch to ON.	Transmitter PLATE indicator lamp lights.	Make continuity tests of the following items: Indicator lamp. Relay K1. PLATE switch.

Step	Unit	Action	Normal indication	Corrective measures
				Crystal rectifier. Use Electron Tube Test Set TV–7(*)/U and check tubes V6 and V7.
8	Transmitter	Place the METER SWITCH in the following positions:		
		OSC Ig	Normal reading for 1 watt output, .42 ma.	If reading is abnormal, check tube V1A. Check crystal Y1 by substitution or for resistance of a forward to back ratio of 1 to 1.
		OSC Ik	Normal reading for 1 watt output, .55 ma.	Higher echelon repair required.
		1 TRIP Ig	Normal reading for 1 watt output, .44 ma.	Check tube V1B.
		1 TRIP Ik	Normal reading for 1 watt output, .32 ma.	Higher echelon repair required.
		2 TRIP Ig	Normal reading for 1 watt output, .44 ma.	Check tube V2.
		2 TRIP Ik	Normal reading for 1 watt output, .55 ma.	Higher echelon repair required.
		DRIVER Ig	Normal reading for 1 watt output, .37 ma.	Check tube V3.
		DRIVER Ik	Normal reading for 1 watt output, .41 ma.	Higher echelon repair required.
		PA Ig	Normal reading for 1 watt output, .58 ma.	Check V4.
		PA Ip	Normal reading for 1 watt output, .24 ma.	Higher echelon repair required.
		MOD Ik	Normal reading for 1 watt output, .66 ma.	Check V8 and V9.
9	Converter	Turn the test switch to RECEIVE.	800 cps fed to input circuit of hybrid tube. tube. Minimum signal voltage should be present at TP1 and TP2, ~~and 20 cps ringing current is fed out of converter and activates line signal on panel of local switchboard.~~	Use a voltmeter connected in jacks TP 1 and 2 (TM 11–212–10), adjust R4 for minimum reading. If meter does not vary as R4 is turned, check input circuit of V1 (between pin 1 and chassis) in converter for 800 cps signal. If 800 cps is not present at V1 input, check contacts on test switch.
		Turn to TRANSMIT position.	20 cps ringing current fed to distant switchboard and line signal is activated on panel of distant switchboard.	In local converter, check cable to transmitter (par. 11).
				In local transmitter, check antenna cable (par. 11).
				In receiver at other end of link, check the audio line to switchboard.

	Step	Unit	Action	Normal indication	Corrective measures
STOP	10	Transmitter.....	Set the PLATE and FIL switches to OFF.	Indicator lamps go out; all power is removed from set.	
	11	Receiver.....	Set POWER switch to OFF.	POWER and REC or STDBY indicator lamps go out.	Check switch.
	12	Converter.....	Set POWER switch to OFF.	POWER indicator lamp goes out.	Check switch.

9. Tube Testing Techniques
(figs. 2, 3, and 4)

When trouble occurs, check all cabling, connections, and power sources before removing tubes. Try to isolate the trouble to a component or stage. If tube failure is suspected, use the applicable procedure below to check the tubes.

Caution: Do not rock or rotate a tube when removing it from a socket; pull it straight out with a tube puller.

a. Use of Tube Tester. Remove and test one tube at a time. Discard a tube only if its defect is obvious or if the tube tester shows it to be defective. Do not discard a tube that tests at or near its minimum test limit on the tube tester. Put back the original tube, or insert a new one if required, before testing the next one.

b. Single-tube Substitution Method.

(1) Substitute a new tube for one of the suspected original tubes. If the equipment continues to be inoperative, replace the new tube with the original. Similarly, check each original tube suspected, one at a time, until the defective tube is located and the equipment becomes operative. Discard the last original tube removed from the equipment. DO NOT LEAVE A NEW TUBE IN A SOCKET IF THE EQUIPMENT OPERATES SATISFACTORILY WITH THE ORIGINAL TUBE.

(2) If the above method of tube substitution does not correct the trouble, try the method described in *c* below.

c. Multitube Substitution Method. Occasionally, two or more tubes are defective. It is then necessary to install new tubes, one at a time, until the equipment becomes operative. Proceed as follows:

(1) Remove one of the suspected original tubes. Install a new tube. If the equipment is still inoperative, leave the new tube in place and remove the next suspected tube. Mark the original tubes with the socket number from which they are removed. Continue this procedure until the equipment becomes operative. The last original tube removed is defective and should be discarded.

(2) To determine whether another original tube is defective, return one of them to its original socket. If there is no noticeable difference in performance, leave the original tube in the equipment. In the same way, return the remaining original tubes to their sockets, one at a time. If failure occurs, or performance suffers, discard the last original tube installed. DO NOT LEAVE A NEW TUBE IN A SOCKET IF THE EQUIPMENT OPERATES SATISFACTORILY WITH THE ORIGINAL TUBE.

d. Tune-In for Repair. If none of the procedures outlined above restores the equipment to normal operation, *return the original tubes to their sockets* before forwarding the defective item to a higher echelon for repair.

e. Removal of Tubes. To reach the tubes in Radio Set AN/TRC–47, proceed as follows:

(1) Remove the rear panel of the cabinet.

(2) Remove the RF shield on the transmitter chassis.

(3) All tubes in the converter, transmitter, and receiver (figs. 2, 3, and 4) can now be reached easily.

(4) Check tubes in the suspected unit by using the methods described in *a* or *b* above.

(5) Replace the rear panel of the cabinet.

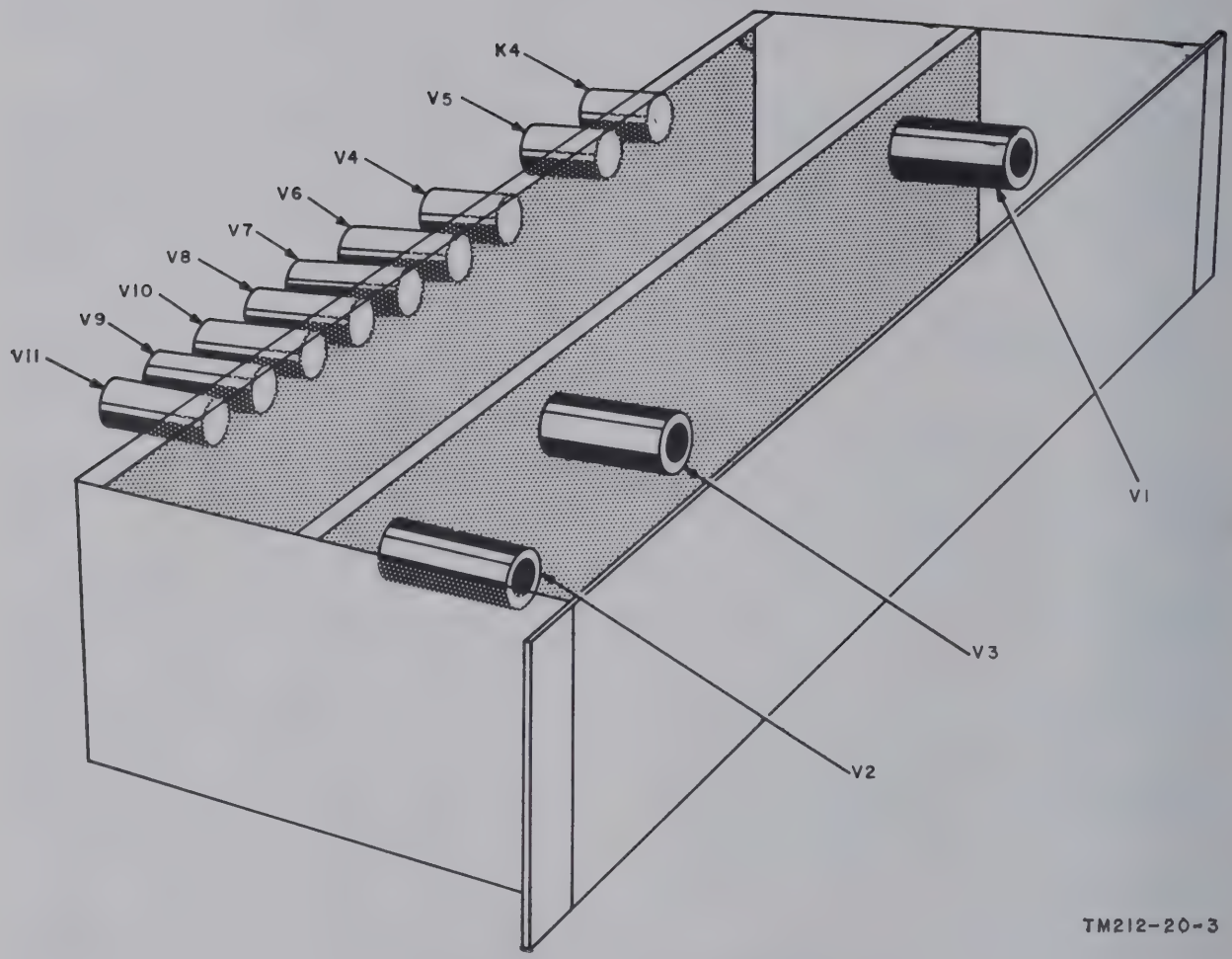


Figure 2. Converter tube location chart.

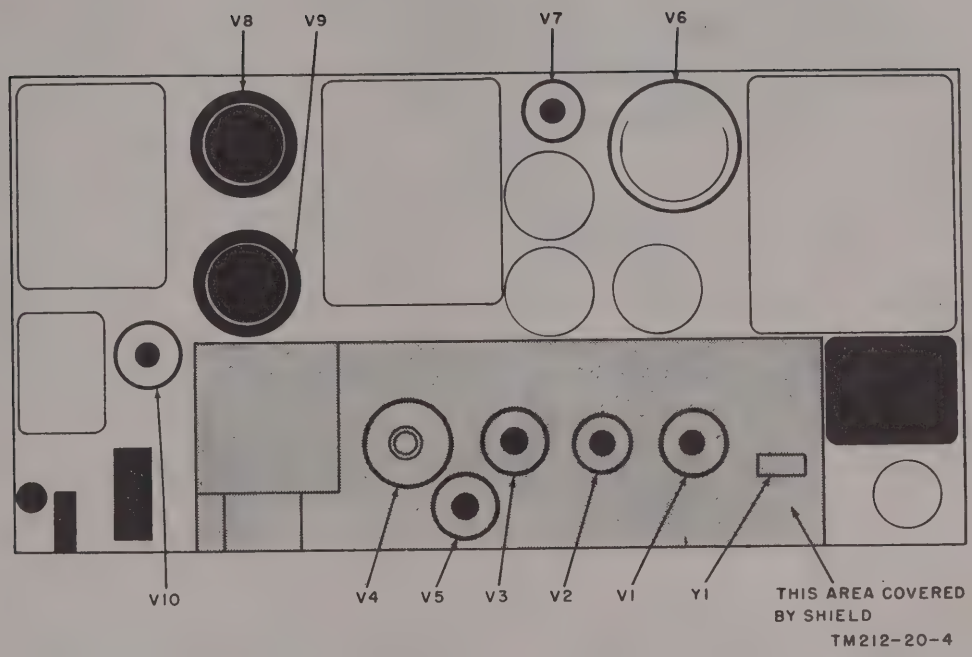


Figure 3. Transmitter tube location chart.

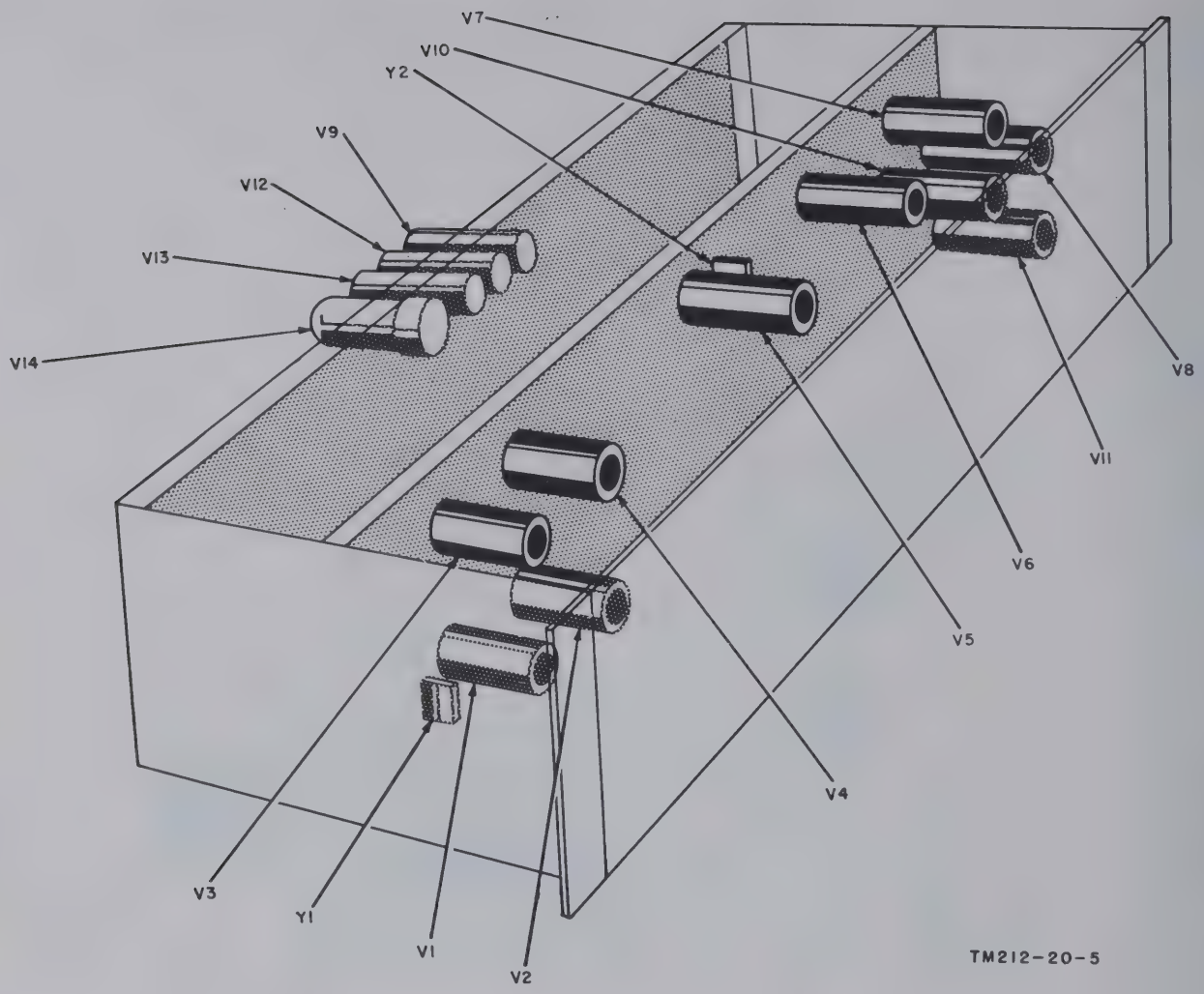


Figure 4. Receiver tube location chart.

10. Repair of Defective Cords and Cables

a. Cord and cable troubles often occur under conditions of severe vibration where cables are used to connect equipment or when equipment is handled improperly from frequent disconnecting and connecting.

b. The most common cable trouble is breakage of conductors within the cable, usually at the connecting plug. A two-wire power cord used in the equipment is often the source of trouble. The cord frequently becomes frayed and a short circuit occurs, or the wire breaks at the plug. A break is most commonly caused by pulling at the cord to remove the plug instead of pulling at the plug. If the plug is not attached properly, the strain of pulling on the cord may cause the cord to pull off or break.

c. To replace the plug on a power cord, thread the cord through the hole in the plug and tie the cord in a knot with the insulation intact. This procedure will keep the strain on the knot rather than on the connection. Remove approximately ½ inch of insulation from the end of each conductor. Tin the ends of the wires with a soldering iron before they are attached to the plug. The tinning will form a solid mass at the ends and eliminate loose ends which may cause short circuits. Wrap each wire (in a clockwise direction) around a screw. When the screw is tightened the wire will be pulled tight in the same direction as the screw.

d. In multiconductor cables, the most common trouble is a broken or open conductor at the connector terminal. To make this repair, disassemble the connector and remove the broken end from the terminal while heating the terminal with a soldering iron. If the remaining wire is too short to reach the terminal, splice and solder a piece to it as an extension. Proceed as follows:

(1) Slip a piece of spaghetti tubing over the wire before the splice is made. After splicing and soldering slide the spaghetti tubing over the joint. Solder the other end of the extension to the proper terminal. If necessary, clean out the excess solder from the terminal by heating it with a soldering iron. Shake the old solder out while it is still hot.

(2) All the conductors should be inspected because if one is broken, others may be broken, or near the breaking point. If others are badly worn or damaged, cut out the damaged part or replace the cable.

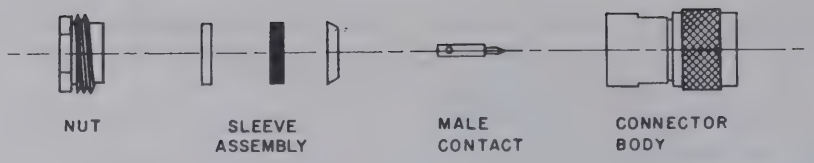
e. If two conductors short together inside the cable and it is not practical to open the cable, as in the case of one with a heavy rubber covering, replace the cable.

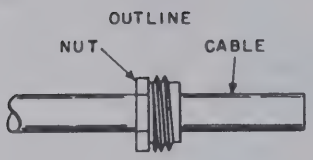
11. Repairing Shielded Cables

a. Shielded cables are repaired the same as unshielded cables. Shielding keeps magnetic fields from causing radiation interference from reaching the conductors. It is therefore important to reconnect the shield if it has been disconnected.

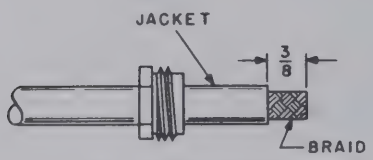
b. When shielded cable is used, make the shield connection shorter than any other connection, so that the shield will prevent the conductors from breaking when any strain is put on the cable.

c. To replace a plug on a coaxial cable, follow the step-by-step procedure shown in figure 5. Take special care in cutting off the insulation. While cutting the insulation at right angles to the conductors as shown in figure 5, there is danger of nicking the conductor; which will make it weak at that point and cause it to break easily. If possible, cut the insulation at an angle, and there will be less danger of nicking the wire.

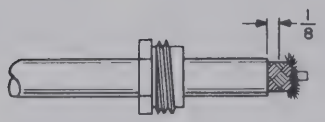




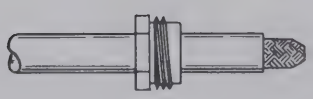
1. CUT OFF SHARP



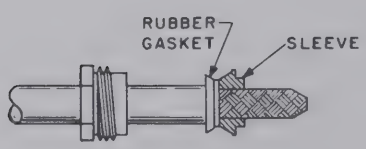
2. CUT OFF JACKET 3/8 INCH FROM END; BE CAREFUL NOT TO NICK BRAID.



3. CUT OFF INNER INSULATION UNDER BRAID 1/8 INCH FROM END OF JACKET; BE CAREFUL NOT TO NICK INNER CONDUCTOR.

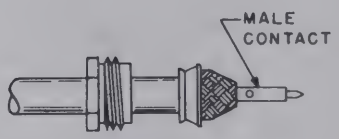


4. TAPER BRAID.

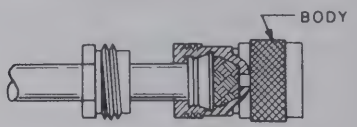


5. SLIDE RUBBER GASKET AND SLEEVE OVER TAPERED BRAID TO FIT TIGHT AGAINST JACKET. BE SURE INNER SHOULDER OF SLEEVE FITS SQUARELY AGAINST END OF CABLE JACKET.

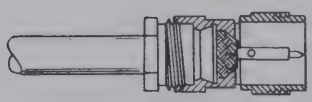
6. WITH SLEEVE IN PLACE, FOLD BACK BRAID SMOOTH AS SHOWN.



7. TIN INSIDE HOLE OF MALE CONTACT, TIN CENTER CONDUCTOR OF COAXIAL CABLE, SLIP MALE CONTACT IN PLACE AND SOLDER; REMOVE EXCESS SOLDER. BE SURE CABLE DIELECTRIC IS NOT HEATED EXCESSIVELY.



8. PUSH INTO BODY AS FAR AS IT WILL GO, THEN SLIDE NUT INTO BODY AND SCREW INTO PLACE, WITH WRENCH, UNTIL MODERATELY TIGHT.



9. FINAL ASSEMBLY SHOWN IN SECTION.

TM212-20-2

Figure 5. Attaching plug to coaxial cable.

CHAPTER 3

SHIPMENT AND LIMITED STORAGE

12. Disassembly of Equipment

The following instructions are recommended as a guide for preparing Radio Set AN/TRC-47 for shipment and storage:

a. Removal of Cables.

(1) Remove the rear cover of the cabinet after removing the screws.

(2) Disconnect the telephone line and wind the line on a reel.

(3) Disconnect all cables and cords from the three units.

b. Removal of Units.

(1) Lay the cabinet on its back (front panels of converter, transmitter, and receiver facing upward).

(2) Remove the mounting screws.

(3) Remove the units, individually, from the cabinet.

c. Removal of Antennas.

(1) Remove the clamps which fasten the antennas to their respective poles and lower the antennas.

(2) Remove the antenna cables and then coil the cables.

(3) Disassemble the antennas by removing the antenna mounting hardware.

(4) Wrap the reflector rods with a strap.

(5) Place the radiators in a carton or container.

(6) Place all hardware and mounting brackets in cartons.

13. Repackaging for Shipment or Limited Storage

The exact procedure for repackaging depends upon the material available and the conditions under which the equipment is shipped or stored. Adapt the procedures outlined below whenever possible. The information concerning the original packaging (TM 11-212-10) will also be helpful.

a. Material Requirements. The following materials are required for packaging Radio Set AN/TRC-47. For stock numbers of materials, consult SB 38-100, Preservation, Packaging and Packing Materials, Supplies and Equipment Used in the Army.

Material	Quantity
Gummed tape	12 ft.
Waterproof barrier material	110 sq. ft.
Waterproof tape	32 ft.
Corrugated fiberboard, single-face	160 sq. ft.
Strapping steel	70 ft.
Wooden shipping boxes	3
Pressure-sensitive tape	

b. Packaging. Package Radio Set AN/TRC-47 in accordance with procedures specified in the following subparagraphs:

(1) *Technical manual.* Inclose each technical manual within a close-fitting bag of waterproof barrier material. Seal seams with waterproof, pressure-sensitive tape.

(2) *Radio Transmitter T-593(*)/TRC-47.* Cushion the radio transmitter on all surfaces with pads and flexible corrugated fiberboard. Secure the cushioning with gummed paper tape. Inclose within a wrap of single-face, flexible, corrugated fiberboard and secure the wrap with waterproof, pressure-sensitive tape.

(3) *Radio Receiver R-748(*)TRC-47.* Package the radio receiver by following the procedures in (2) above.

(4) *Telephone Signal Converter CV-542 TRC-47.* Package the telephone signal converter by following the procedures in (2) above.

(5) *Cables.* Cushion each item individually by wrapping it in flexible, single-face, corrugated fiberboard. Secure the cushioning with gummed paper tape.

(6) *Spare parts.* Wrap these items (listed in TM11-212-10) in flexible, single-face, corrugated fiberboard. Place in a carton or box and cushion with gummed paper tape.

(7) *Electrical Equipment Cabinet CY-2126/TRC-47.* Place the items packaged as specified in (5) and (6) above

within the cabinet and secure them to the cabinet to prevent movement during transit.

(8) *Antenna AS–813/TRC–47.* Cushion each antenna by wrapping it in flexible, single-face, corrugated fiberboard. Secure the wrap with waterproof, pressure-sensitive tape.

c. Packing. Pack Radio Set AN/TRC–47 in accordance with procedures specified in the following subparagraphs; build all boxes so that the contents fit snugly.

(1) Fit sealed waterproof case liners in each shipping container.

(2) Place Radio Transmitter T–593(*)/TRC–47, Radio Receiver R–748(*)/TRC–47, and Telephone Signal Converter CV–542/TRC–47 (packaged as specified in *b*(2)–(4) above) together in a nailed wooden box.

(3) Place Electrical Equipment Cabinet CY–2126/TRC–47, with contents packaged as specified in *b*(5) through *b*(7) above, in a nailed wooden box. Secure the technical manual packaged as specified in *b*(1) above, between contents and lid of the box.

(4) Place two each Antenna AS–813/TRC–47 packaged as specified in *b*(6) above, within a nailed wooden box.

(5) Arrange the boxes containing components of Radio Set AN/TRC–47 in the following sequence:

Radio Transmitter T–593(*)/TRC–47,
Radio Receiver R–748(*)/TRC–47 and
Telephone Signal Converter CV–542/TRC–47.....Box 1 of 3
Electrical Cabinet Equipment CY–2126/TRC–47 with cables.....Box 2 of 3
Two each Antenna AS–813/TRC–47.....Box 3 of 3

(6) Strap shipping containers only on intertheater shipment.

(7) Mark the shipping containers in accordance with the requirements of Standard MIL–STD–129.

Appendix I ADDED See C#2

APPENDIX II

MAINTENANCE ALLOCATION CHART

FOR

RADIO SET AN/TRC-47

Section I. PREFACE

1. General

a. The maintenance allocation portion of the Technical Manual assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. The lists in Section II are presented in columns titled as follows:

(1) PART OR COMPONENT. Only the nomenclature or standard item name is annotated in this column. Additional descriptive data is included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and sub-assemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) RELATED OPERATION. This column indicates the various maintenance functions allocated to the echelon capable of performing the operation. These are defined as follows:

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, sub-assemblies, and parts for unserviceable components.

(f) Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(g) Align. To adjust two or more components of an electrical system so that their functions are properly synchronized.

(h) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(i) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of each of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, sub-assemblies, and parts.

(3) ECHELON ALLOCATED THE MAINTENANCE OPERATION. The symbol "X" placed in the appropriate column indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by "X" are authorized to perform the indicated operation.

(4) REPAIR FACILITIES CODE. Code numbers are assigned to each individual tool equipment, test equipment and maintenance equipment referenced under "Inclosure To The Maintenance Allocation Chart". The grouping of codes in the Repair Facilities Code Column of the Maintenance Allocation Chart indicate the tool, test and maintenance equipment required to perform the maintenance operation.

(5) REMARKS. Entries in this column will be utilized when necessary to clarify any of the data cited in the preceeding columns.

(6) INCLOSURE TO THE MAINTENANCE ALLOCATION CHART.

(a) FACILITIES REQUIRED FOR MAINTENANCE OPERATIONS. Tools, test and maintenance equipment required to perform the maintenance functions are listed in this column and coded in the Repair Facilities Code column.

(b) ECHELON ALLOCATED THE FACILITY. The symbol "†" placed in the appropriate columns indicates the echelons allocated the facility.

2. Contents of the Maintenance Allocation Chart

The major items of RADIO SET AN/TRC-47 appear in the Maintenance Allocation Chart (Section II below) in the following sequence.

Radio Set AN/TRC-47
  Antenna AS-813/TRC-47
  Cabinet Electrical CY-2126/TRC-47
  Converter CV-542A/TRC-47
  Receiver, Radio R-748A/TRC-47
  Transmitter, Radio T-593A/TRC-47

3. Comments or Suggestions

Any comments concerning omissions and discrepancies in this appendix will be prepared on DA Form 2028 and forwarded directly to Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, New Jersey, Attn: SIGFM/ES-ML.

TM 212-20 APP -2

APPENDIX

MAINTENANCE ALLOCATION CHART, PART II, SECTION II

PART OR COMPONENT	RELATED OPERATION	ECHELON ALLOCATED THE MAINTENANCE OPERATION						REPAIR FACILITIES CODE	REFERENCE
		OPERATOR	ORGANIZATIONAL		FIELD		DEPOT		
		FIRST	SECOND ECHELON		THIRD	FOURTH	FIFTH		
		ECHELON	TACTICAL	FIXED	ECHELON	ECHELON	ECHELON		
RADIO SET AN/TRC-47									
	replace		X						
	repair		X						
	rebuild						X		
ANTENNA AS-813/TRC-47									
	replace		X						
	repair		X						
COUNTERPOISE	replace		X						
REFLECTOR	replace		X						
SUPPORT ANTENNA	replace		X						
GASKET	replace				X				
INSULATOR, STAND-OFF	replace				X				
ANTENNA ELEMENT	replace		X						
CONNECTOR	replace				X				
CABINET, ELECTRICAL CY-2126/TRC-47									
	replace		X						
	rebuild						X		
CABLE ASSEMBLIES	replace		X						
	repair				X				
CONVERTER CV-542/TRC-47									
	replace		X						
	repair		X						
	rebuild						X		
	adjust				X			6	
	service	X							
	inspect	X							
	test		X					1,2,3	Testing of tubes, voltage and resistance measurements may be performed.
	test				X			1,2,4,5,6,8,11 13	
	test						X	1,4,5,6,8,11, 12,13	Final Test
	calibrate						X	1-6,8,9,12,13	

PART OR COMPONENT	RELATED OPERATION	ECHELON ALLOCATED THE MAINTENANCE OPERATION						REPAIR FACILITIES CODE	REFERENCE
		OPERATOR	ORGANIZATIONAL		FIELD		DEPOT		
		FIRST ECHELON	SECOND TACTICAL	ECHELON FIXED	THIRD ECHELON	FOURTH ECHELON	FIFTH ECHELON		
AN/TRC-47 (continued)									
CABLE ASSEMBLY	replace		X						
	repair				X				
CAP, ELECTRICAL	replace		X						
CAPACITOR	replace				X				
CONNECTOR	replace				X				
ELECTRON TUBE	replace		X						
	inspect		X						
	test		X					2,12	
FUSE	replace		X						
GENERATOR, RINGING	replace				X				
JACK, TIP	replace				X				
KNOB	replace		X						
LAMPHOLDER	replace				X				
LIGHT, INDICATOR	replace		X						
POST, BINDING	replace		X						
CONNECTOR	replace				X				
RELAY ARMATURE	replace				X				
RESISTOR	replace				X				
RESONATOR	replace				X				
SEMI CONDUCTOR DIODE	replace				X				
SHIELD	replace		X						
SOCKETS	replace				X				
SWITCH, ROTARY	replace				X				
SWITCH, TOGGLE	replace		X						
TRANSFORMER	replace				X				
RECEIVER, RADIO R-740A/TRC-47									
	replace		X						
	repair		X						
	rebuild						X		
	service	X							
	inspect	X							
	test		X						
	test				X				
	test						X		
	align				X				
CABLE ASSEMBLIES	replace		X						
	repair				X				
CAP, ELECTRICAL	replace		X						

TAGO 6249A

PART OR COMPONENT	RELATED OPERATION	ECHELON ALLOCATED THE MAINTENANCE OPERATION						REPAIR FACILITIES CODE	REFERENCE
		OPERATOR	ORGANIZATIONAL		FIELD		DEPOT		
		FIRST ECHELON	SECOND ECHELON TACTICAL	SECOND ECHELON FIXED	THIRD ECHELON	FOURTH ECHELON	FIFTH ECHELON		
AN/TRC-47 (continued)									
CAPACITOR	replace				X				
CRYSTAL	replace		X						
COIL, RF	replace				X				
CONNECTOR	replace				X				
ELECTRON TUBE	replace		X						
	inspect		X					2,3	
	test		X						
FUSE	replace		X						
FUSEHOLDER	replace				X				
JACK, TIP	replace				X				
KNOB	replace		X						
LAMP, INCANDESCENT	replace		X						
LIGHT, INDICATOR	replace				X				
LOUDSPEAKER	replace				X				
REACTOR	replace				X				
RELAY	replace				X				
RESISTOR	replace				X				
SHIELD	replace		X						
SOCKET	replace				X				
SWITCH	replace				X				
TRANSFORMER	replace				X				
TRANSMITTER, RADIO T-593A/TRC-47									
	replace		X						
	repair		X						
	rebuild						X		
	adjust		X					10,13	
	service	X							
	inspect	X							
	test		X					1,2,3	Testing of tubes, voltage and resistance measurements may be performed.
	test				X			1,2,4,5,6,7,8,9 10,11,13	
	test						X	1 and 4 thru 13	Final Test
	align				X			1,2,4 thru 13	

PART OR COMPONENT	RELATED OPERATION	ECHELON ALLOCATED THE MAINTENANCE OPERATION						REPAIR FACILITIES CODE	REFERENCE
		OPERATOR	ORGANIZATIONAL		FIELD		DEPOT		
		FIRST ECHELON	SECOND ECHELON TACTICAL	SECOND ECHELON FIXED	THIRD ECHELON	FOURTH ECHELON	FIFTH ECHELON		
AN/TRC-47 (continued)									
CABLE ASSEMBLY	replace		X						
	repair				X				
CAPACITOR	replace				X				
COIL	replace				X				
CONNECTOR	replace				X				
CRYSTAL	replace		X						
ELECTRON TUBE	replace		X						
	inspect		X						
	test		X					2,5	
FUSE	replace		X						
FUSEHOLDER	replace				X				
JACK	replace				X				
KNOB	replace		X						
LAMP, INCANDESCENT	replace		X						
LIGHT, INDICATOR	replace				X				
METER	replace				X				
REACTOR	replace				X				
RECTIFIER	replace				X				
RELAY	replace				X				
RESISTOR	replace				X				
SCREW	replace				X				
SHIELD	replace		X						
SOCKET	replace				X				
SWITCH	replace				X				
TRANSFORMER	replace				X				

TAGO 6249A

APPENDIX
INCLOSURE TO THE
MAINTENANCE ALLOCATION CHART, PART II, SECTION II

FACILITIES REQUIRED FOR MAINTENANCE OPERATIONS	ECHELON ALLOCATED THE FACILITY						REPAIR FACILITIES CODE	REFERENCE
	OPERATOR	ORGANIZATIONAL		FIELD		DEPOT		
	FIRST ECHELON	SECOND ECHELON TACTICAL	SECOND ECHELON FIXED	THIRD ECHELON	FOURTH ECHELON	FIFTH ECHELON		
AN/TRC-47 (continued)								
MULTIMETER ME-77/U		†		†	†	†	1	
TUBE TESTER TV-7/U		†		†	†		2	
TOOL EQUIPMENT TE-41		†					3	
AUDIO OSCILLATOR TS-382/U				†	†	†	4	
ANALYZER SPECTRUM TS 723/U				†	†	†	5	
VOLTMETER METER ME-30A/U				†	†	†	6	
SIGNAL GENERATOR TS-497/URR				†	†	†	7	
ELECTRONIC MULTIMETER TS 505/U				†	†	†	8	
FREQUENCY METER AN/URM-32 with POWER SUPPLY PP-1243/U				†	†	†	9	
RADIO FREQUENCY WATTMETER AN/URM-43				†	†	†	10	
TEST SET SIGNAL GENERATOR AN/USM-65( )				†	†	†	11	
TUBE TESTER TV-2/U						†	12	
TOOL EQUIPMENT TE-113				†	†	†	13	

[AG 413.44 (30 Apr. 58)]

By Order of *Wilber M. Brucker,* Secretary of the Army:

MAXWELL D. TAYLOR
General, United States Army,
Chief of Staff.

Official:

HERBERT M. JONES,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

ASA (2)
CNGB (1)
Technical Stf, DA (1) except CSigO (30)
Technical Stf Bd (1)
USA Arty Bd (1)
USA Armor Bd (1)
USA Inf Bd (1)
USA Air Def Bd (1)
USA Abn & Elct Bd (1)
USA Avn Bd (1)
USA Armor Bd Test Sec (1)
USA Air Def Bd Test Sec (1)
USA Arctic Test Bd (1)
USCONARC (5)
US ARADCOM (2)
US ARADCOM Rgn (2)
OS Maj Comd (5)
Log Comd (5)
MDW (1)
Armies (5)
Corps (2)
Div (2)
USATC (2)
Ft & Camps (2)
Svc Colleges (5)
Br Svc Sch (5) except USASCS (25)
Gen Depots (2) except Atlanta Gen Depot (None)
Sig Sec, Gen Depots (10)
Sig Depots (17)
Fld Comd, AFSWP (5)
Engr Maint Cen (1)
Army Pictorial Cen (2)
WRAMC (1)
AFIP (1)
AMS (1)
Port of Emb (OS) (2)
Trans Terminal Comd (2)
Army Terminals (2)
OS Sup Agcy (2)
USA Sig Pub Agcy (8)
USA Sig Engr Agcy (1)
USA Com Agcy (2)
TASSA (13)
Mid-Western Rgn Ofc (TASSA) (1)
USA Sig Eqp Spt Agcy (2)
USA White Sands Sig Agcy (13)
Yuma Test Sta (2)
USA Elct PG (1)
Sig Fld Maint Shops (3)
Sig Lab (5)
Mil List (1)
US Army Corps (Res) (1)
Sectors, USA Corps (Res) (1)
JBUSMC (2)
Units org under fol TOE:
11 7 (2)
11 16 (2)
11 57 (2)
11 127 (2)
11 128 (2)
11 500 (AA AE) (2)
11 557 (2)
11 587 (2)
11 592 (2)
11 597 (2)
44 145 (2)
44 147 (2)
44 445 (2)
44 447 (2)

NG: State AG (6); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

U. S. GOVERNMENT PRINTING OFFICE: 1965—204426/435